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Novel thickening latex, manufacturing process and
cosmetic applications

FIELD OF THE INVENTION

The present application relates to thickening
5 water-in-oil latices, to a process for their
preparation and to their application as thickeners
and/or emulsifiers for skincare products and haircare
products or for the manufacture of cosmetic, dermo-
pharmaceutical or pharmaceutical preparations.)

BACKGROUND OF THE INVENTION
10 Various thickeners exist and are already used
for these purposes. Natural products such as guar gum
or corn starch are known in particular, the drawbacks
of which are those inherent to natural products, such
as price fluctuations, supply difficulties and random
15 quality.

Synthetic polymers in powder form, mainly
polyacrylic acids, are also widely used but have the
drawback of requiring neutralization when they are
used, since they only develop their viscosity from a pH
20 > 6.5 and they are often difficult to dissolve.

Synthetic thickening polymers in the form of an
inverted latex, that is to say one in which the
continuous phase is an oil, are also known. These
latices dissolve extremely quickly; the polymers
25 contained in these inverted latices are usually
acrylamide/alkali metal acrylate copolymers or acryla-
mide/sodium 2-acrylamido-2-methylpropane-sulphonate co-
polymers; they are already neutralized and when they
are dissolved in water, for example to a concentration
30 of 1%, it is observed that the pH is generally above 6.

However, acrylamide/sodium acrylate copolymers
do not develop any appreciable thickening properties
when the pH is lowered below 6; on the other hand, the
acrylamide/sodium 2-acrylamido-2-methylpropane-sulpho-
35 nate copolymers described in EP 0,503,853 retain an
appreciable thickening capacity even at pH 4.

However, such copolymers have monoacrylamide
contents which, although extremely low, could result in
making them impossible to use in cosmetics in the near

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The Applicant has thus been concerned with the synthesis and development of polymers that thicken, even at acidic pH, in the form of an inverted latex, without using monoacrylamide. *(SEE INVENTION)*

without using monoacrylamide

SUMMARY OF THE INVENTION

One subject of the invention is a composition comprising an oil phase, an aqueous phase, at least one emulsifier of water-in-oil (W/O) type, at least one emulsifier of oil-in-water (O/W) type, characterized in that the ~~said~~ composition is an inverted latex comprising from 20% to 60% by weight, and preferably from 25% to 45% by weight, of a branched or crosslinked anionic polyelectrolyte based on at least one monomer possessing a strongly acidic function, copolymerized either with at least one monomer possessing a weakly acidic function or with at least one neutral monomer.

The expression "emulsifier of the water-in-oil type" is understood to denote emulsifiers having an HLB value that is low enough to give water-in-oil emulsions, such as the surfactant polymers sold under the name Hypermer™ or such as sorbitan extracts, for instance sorbitan monooleate sold by the company SEPPIC under the tradename Montane 80™, or sorbitan isostearate sold by SEPPIC under the name Montane 70™.

The expression "emulsifier of the oil-in-water type" is understood to denote emulsifiers having an HLB value that is high enough to give oil-in-water emulsions, such as ethoxylated sorbitan esters, for instance sorbitan oleate ethoxylated with 20 mol of ethylene oxide, sold by SEPPIC under the name MONTANOX 80™.

The term branched polymer is understood to denote a non-linear polymer which has pendant chains so as to obtain, when this polymer is dissolved in water, a high degree of entangling leading to very high low-gradient viscosities.

The term crosslinked polymer is understood to denote a non-linear polymer in the form of a three-

dimensional network which is insoluble in water but swellable in water and thus leading to the production of a chemical gel.

5 The composition according to the invention can contain crosslinked units and/or branched units.

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10 The subject of the invention is, in particular, a composition as defined above, characterized in that the ~~said~~ anionic polyelectrolyte is the result of a copolymerization of its precursor monomers, which is carried out at a pH below 4.

The subject of the invention is also a composition as defined above, characterized in that 30% to 90% of the monomer units which comprise the anionic polyelectrolyte have a strongly acidic function.

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15 The strongly acidic function of the monomer containing it is, in particular, a sulphonic acid function or a phosphonic acid function, partially or totally salified. The ~~said~~ monomer can be for instance, styrenesulfonic acid partially or totally salified. It
20 is preferably 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-propanesulphonic acid partially or totally salified in the form of an alkali metal salt or an ammonium salt. The weakly acidic function of the monomer containing it is, in particular, a carboxylic acid function, and the
25 ~~said~~ monomer is preferably chosen from acrylic acid, methacrylic acid, itaconic acid and maleic acid. The neutral monomer is chosen in particular from 2-hydroxyethyl acrylate, 2,3-dihydroxypropyl acrylate, 2-hydroxyethyl methacrylate and 2,3-dihydroxypropyl
30 methacrylate, or an ethoxylated derivative, with a molecular weight between 400 and 1000, of each of these esters.

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35 According to a specific aspect of the present invention, it relates to a composition comprising an oil phase, an aqueous phase, at least one emulsifier of water-in-oil (W/O) type and at least one emulsifier of oil-in-water (O/W) type, characterized in that the ~~said~~ composition is a reverse latex comprising from 20% to 60% by weight, and preferably from 25% to 45% by

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weight, of a branched or crosslinked, anionic polyelectrolyte based on partially or totally salified 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-propanesulfonic acid, copolymerized with 2-hydroxyethyl acrylate, more particularly, a composition as defined above, characterized in that 30% to 90%, preferably 50% to 90%, in molar proportions, of the monomer units comprised by the anionic polyelectrolyte is 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-propanesulfonic acid (MPSA) partially or totally salified, and in particular a composition as defined above, for which the anionic polyelectrolyte contains, in molar proportions, from 60% to 90% of sodium salt or of ammonium salt of 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-propanesulfonic acid and from 10% to 40% of 2-hydroxyethyl acrylate.

According to another specific aspect of the present invention, it relates to a composition as defined above, characterized in that the ~~said~~ composition is a reverse latex comprising from 20% to 60% by weight, and preferably from 30% to 45% by weight, of a branched or crosslinked, anionic polyelectrolyte based on a 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-propanesulfonic acid, which is partially or totally salified in the form of sodium salt or of ammonium salt, copolymerized with acrylic acid, partially salified in the form of the sodium salt or of ammonium salt.

The subject of the invention is, more particularly, a composition as defined above, characterized in that the anionic polyelectrolyte is crosslinked and/or branched with a diethylenic or polyethylenic compound in a molar proportion, expressed relative to the monomers used, of from 0.005% to 1% and preferably from 0.01% to 0.2%, and more particularly from 0.01% to 0.1%, and preferably that for which the crosslinking agent and/or the branching agent is chosen from ethylene glycol dimethacrylate, sodium diallyloxycetate, ethylene glycol diacrylate, diallylurea, trimethylolpropane triacrylate or methylene-

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The latex according to the invention generally contains from 2.5% to 15% by weight, and preferably from 4% to 9% by weight, of emulsifiers, among which from 20% to 50%, in particular from 25% to 40%, of the total weight of the emulsifiers present are of the water-in-oil (W/O) type and in which from 80% to 50%, in particular from 75% to 60%, of the total weight of the emulsifiers are of the oil-in-water (O/W) type.

10 According to a specific aspect, the composition
as defined above is characterized in that the oil phase
represents from 15% to 40%, preferably from 20% to 25%,
of its total weight.

This oil phase either consists of a commercial mineral oil containing saturated hydrocarbons such as paraffins, isoparaffins or cycloparaffins having, at room temperature, a density of between 0.7 and 0.9 and a boiling point above 180°C, such as, for example, Exxsol™ D 100 S or Marcol™ 52 sold by Exxon Chemical, isohexadecane or isododecane, or consists of a plant oil or a synthetic oil or of a mixture of several of these oils.

According to a preferred aspect of the present invention, the oil phase consists of Marcol™ 52 or of isohexadecane; isohexadecane, which is identified in Chemical Abstracts by the number RN = 93685-80-4, is a mixture of C₁₂, C₁₆ and C₂₀ isoparaffins containing at least 97% of C₁₆ isoparaffins, among which the main constituent is 2,2,4,4,6,8,8-heptamethylnonane (RN = 4390-04-9). It is marketed in France by the company Bayer. Marcol™ 52 is a commercial oil corresponding to the definition of liquid petroleum jellies in the French Codex. This is a white mineral oil in accordance with the FDA Regulations 21 CFR 172.878 and CFR 178.3620 (a) and it is listed in the USA Pharmacopoeia, US XXIII (1995) and in the European Pharmacopoeia (1993).

The latices contain between 20% and 50% water. The latices according to the invention can also contain

various additives such as complexing agents, transfer agents or chain-limiting agents.

According to another aspect of the present invention, its subject is a process for preparing the composition as defined above, characterized in that:

a) an aqueous solution containing the monomers and the optional additives is emulsified in an oil phase in the presence of one or more emulsifiers of water-in-oil type,

b) the polymerization reaction is initiated by introducing a free-radical initiator into the emulsion formed in a), after which the reaction is left to proceed,

c) when the polymerization reaction is complete, one or more emulsifiers of oil-in-water type are introduced at a temperature below 50°C.

According to a variant of this process, the reaction medium obtained after step b) is concentrated by distillation before step c) is carried out.

According to a preferred embodiment of the process as defined above, the polymerization reaction is initiated by a redox couple, such as the cumene hydroperoxide/sodium metabisulphite couple, at a temperature below or equal to 10°C, and is then carried out either in a virtually adiabatic manner up to a temperature above or equal to 40°C, more particularly above or equal to 50°C, or by controlling the temperature evolution.

According to another preferred embodiment of the process, the starting aqueous solution is adjusted to a pH below or equal to 4 before step c) is carried out.

The subject of the invention is also the use of the composition as defined above for preparing a cosmetic, dermo-pharmaceutical or pharmaceutical topical composition.

A topical composition according to the invention, intended to be applied to the skin or mucous membranes of humans or animals can consist of a topical

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emulsion comprising at least one aqueous phase and at least one oil phase. This topical emulsion can be of the oil-in-water type. More particularly, this topical emulsion can consist of a fluid emulsion, such as a fluid gel or milk. The oil phase of the topical emulsion can consist of a mixture of one or more oils.

A topical composition according to the invention can be intended for cosmetic use or can be used to prepare a medical product intended for the treatment of mucous and skin diseases. In the latter case, the topical composition then contains an active principle which can consist, for example, of an anti-inflammatory agent, a muscle relaxant, an antifungal agent or an antibacterial agent.

When the topical composition is used as a cosmetic composition intended to be applied to the skin or mucous membranes, it may or may not contain an active principle, for example a moisturizer, a tanning agent, a sunscreen, an anti-wrinkle agent, a slimming agent, an anti-radical agent, an antiacne agent or an antifungal agent.

A topical composition according to the invention usually contains between 0.1% and 10% by weight of the thickener defined above. The pH of the topical composition is preferably above or equal to 5.

The topical composition can also contain compounds conventionally included in compositions of this type, for example fragrances, preserving agents, dyes, emollients or surfactants.

According to yet another aspect, the invention relates to the use of the novel thickener mentioned above, in accordance with the invention, to thicken and emulsify a topical composition comprising at least one aqueous phase.

The composition according to the invention is an advantageous substitute for those sold under the name Sepigel™ 305 or Sepigel™ 501 by the Applicant, since it also has good compatibility with the other excipients used for the preparation of formulations

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such as milks, lotions, creams, soaps, baths, balms, shampoos or conditioners. It can also be employed with the said Sepigel.

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^ In particular, the composition is compatible with the concentrates described and claimed in the international publications WO 92/06778, WO 95/04592, WO 95/13863, WO 96/37285, WO 98/22207, WO 98/47610 or in FR 2,734,496, and with the surfactants described in WO 93/08204.

10 The composition is particularly compatible with Montanov™ 68, Montanov™ 82, Montanov™ 202 or Sepiperl™ N. It can also be used in emulsions of the type described and claimed in EP 0,629,396 and in cosmetically or physiologically acceptable aqueous
15 dispersions with an organopolysiloxane compound chosen, for example, from those described in WO 93/05762 or in WO 93/21316.

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20 The composition can also be used to form cosmetically or physiologically acceptable gels that are aqueous at acidic pH, such as those described in WO 93/07856; it can also be used in combination with nonionic celluloses in order to form, for example, styling gels, such as those described in EP 0,684,024, or alternatively in combination with fatty acid esters
25 of a sugar, in order to form compositions for treating the hair or the skin, such as those described in EP 0,603,019, or alternatively in shampoos or conditioners as described and claimed in WO 92/21316, or, lastly, in combination with an anionic homopolymer such as
30 Carbopol™ in order to form hair-treatment products, such as those described in DE 195 23596.

The composition according to the invention is also compatible with active principles such as, for example, self-tanning agents, for instance
35 dihydroxyacetone (DHA) or antiacne agents, and it can thus be introduced into self-tanning compositions such as those claimed in EP 0,715,845, EP 0,604,249, EP 0,576,188 or in WO 93/07902.

The composition is also compatible with N-

acylated derivatives of amino acids, which allows it to be used in soothing compositions especially for sensitive skin, such as those described or claimed in WO 92/21318, WO 94/27561 or WO 98/09611.

5 The examples which follow are intended to illustrate the present invention.

Example 1: Preparation and properties of the inverted latex according to the invention

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A] Preparation

a) The following are loaded into a beaker, with stirring

- 200 g of deionized water
- 15 - 112.1 g of aqueous .48% (by weight) sodium hydroxide solution
- 278.4 g of 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-propanesulphonic acid
- 73.1 g of acrylic acid
- 20 - 0.18 g of sodium diethylenetriaminepentaacetate
- 0.182 g of methylenebisacrylamide

The pH of the aqueous phase described above is adjusted to 3.5 and the amount of aqueous phase is made up to 682 g by adding deionized water.

25 In parallel, an organic phase is prepared by introducing the following ingredients successively into a stirred beaker:

- 220 g of isohexadecane
- 30 - 25 g of Montane 80 VG (sorbitan oleate sold by SEPPIC)
- 0.2 g of azobisisobutyronitrile

The aqueous phase is introduced gradually into the organic phase and is then subjected to vigorous mechanical stirring of ultra-turrax™ type sold by IKA.

35 The emulsion obtained is then transferred into a polymerization reactor. A large amount of nitrogen is bubbled through the emulsion so as to remove the oxygen, and the resulting emulsion is cooled to about

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5-6°C.

5 ml of a solution containing 0.42% (by weight) of cumene hydroperoxide in isohexadecane are then introduced.

5 After a period which is sufficient to obtain good homogenization of the solution, aqueous sodium metabisulphite solution (0.2 g in 100 ml of water) is then introduced at a rate of 0.5 ml/minute. The introduction is carried out over about 60 minutes.

10 During this introduction, the temperature in the polymerization reactor is allowed to rise to the final polymerization temperature.

The reaction medium is then held at this temperature for about 90 minutes.

15 The mixture is cooled to a temperature of about 35°C and 50 g of sorbitan oleate ethoxylated with 20 mol of ethylene oxide are introduced slowly.

The desired emulsion is obtained.

Evaluation of the properties:

20 + viscosity 25°C of the latex (Brookfield RVT, No. 3 spindle, speed 20): = 650 mPa.s

+ viscosity in water containing 2% latex (Brookfield RVT, No. 6 spindle, speed 20): = 33,800 mPa.s.

(Brookfield, No. 6 spindle, speed 5): = 74,000 mPa.s.

25 It is observed that the final product is free of acrylamide.

b) Working in the same manner as in paragraph a), starting with:

- 200 g of deionized water

30 - 121.8 g of aqueous 48% (by weight) sodium hydroxide solution

- 302.66 g of 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-propanesulfonic acid

- 49.54 g of acrylic acid

35 - 0.18 g of sodium diethylenetriamine-pentaacetate, and

- 0.163 g of methylenebisacrylamide.

The desired emulsion is obtained, which has the following characteristics:

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+ viscosity in water containing 2% latex
(Brookfield RVT, No. 6 spindle, speed 20):
= 29,000 mPa.s

5 (Brookfield, No. 6 spindle, speed 5): =
66,000 mPa.s.

It is observed that the final product is also
free of acrylamide.

c) The following are loaded into a beaker, with
stirring:

10 - 608.8 g of a commercial 50% solution of the
sodium salt of 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-
propanesulfonic acid,

- 72.6 g of 2-hydroxyethyl acrylate,

15 - 0.18 g of sodium diethylenetriamine
pentaacetate, and

- 0.121 g of methylenebis(acrylamide),

the pH of the aqueous phase described above is
adjusted to 3.5, by adding 0.7 g of 2-methyl-2-[(1-oxo-
2-propenyl)amino]-1-propanesulfonic acid.

20 In parallel, an organic phase is prepared by
introducing the following successively into a stirred
beaker:

- 220 g of isohexadecane,

25 - 25 g of Montano X80 VG (sorbitan oleate
ethoxylated with 20 mol of ethylene oxide, sold by
SEPPIC) and

- 0.2 g of azobis(isobutyronitrile).

30 The aqueous phase is introduced gradually into
the organic phase and is then subjected to vigorous
mechanical stirring with an Ultra-TurraxTM machine sold
by IKA.

35 The emulsion obtained, characterized by a
viscosity at 25°C of 2600 mPa.s (Brookfield RVT, No. 4
spindle, speed 20), is then transferred into a
polymerization reactor. The emulsion is subjected to
bubbling with nitrogen at a substantial rate so as to
remove the oxygen, and is cooled to about 5-6°C.

10 g of a solution containing 1.1% by weight of
cumene hydroperoxide active material in isohexadecane

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are then introduced. After a sufficient time for good homogenization of the solution, 25 g of aqueous sodium metabisulfite solution (0.2% solution) are introduced over about 25 minutes. During this introduction, the temperature in the polymerization reactor is allowed to rise to the final polymerization temperature and the reaction mixture is then maintained for about 90 minutes at this temperature. The mixture is then cooled to a temperature of about 35°C and 50 g of MontanovTM 80 VG are then introduced slowly. The desired emulsion is obtained.

Evaluation of the properties:

- Viscosity at 20°C of the latex at 3% in water (Brookfield RVT, No. 6 spindle, speed 20):

= 36,700 mPa.s; the pH is 5.1.

The pH is lowered to 3.7 and the following result is then obtained: = 31,000 mPa.s.

It is observed that the final product is free of acrylamide.

d) Working in the same way as in paragraph a), by lowering the amount of methylenebis(acrylamide) from 0.121 g to 0.091 g, an emulsion is obtained which has the following viscosity characteristics:

- Viscosity at 20°C of the latex at 3% in water (Brookfield RVT, No. 6 spindle, speed 20):

= 33,000 mPa.s; the pH is 5.2.

After lowering the pH, the following results are obtained:

at pH = 4.0, = 31,000 mPa.s;

at pH = 2.8, = 18,300 mPa.s.

It is observed that the final product is free of acrylamide.

e) Working in the same way as in paragraph A), by lowering the amount of methylenebis(acrylamide) from 0.121 g to 0.084 g and that of the 2-hydroxyethyl acrylate from 72.6 g to 53 g, and by increasing the amount of commercial 50% solution of the sodium salt of 2-methyl-2-[(1-oxo-2-propenyl)amino]-1-propanesulfonic acid from 608.8 g to 628 g, an emulsion is obtained

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which has the following viscosity characteristics:

- viscosity at 20°C of the latex at 3% in water
(Brookfield RVT, No. 6 spindle, speed 20):

= 27,400 mPa.s; the pH is 5.2.

5 After lowering the pH, the following results
are obtained:

at pH = 4.0, = 27,400 mPa.s;

at pH = 2.8, = 18,200 mPa.s.

10 It is observed that the final product is free
of acrylamide.

15 It is observed that the emulsions obtained have
a very specific feel sensation at and above 1% polymer
in the solution, and that this difference increases as
the concentration increases; it is a very fresh feel
sensation at the start, which melts completely on the
skin, this feel sensation not being experienced at all
with the latices of the prior art.

20 The examples which follow use, without
distinction, the emulsions prepared according to one of
paragraphs A a) to A e) (which are referred to in the
following examples - compound of Example 1).

B] Properties

a) "Emulsifying" power of fatty phases

25 The inverted latex prepared in paragraph A] b)
(composition 1) was used to prepare emulsions with
different types of apolar or polar fatty substances of
plant or synthetic origin. The cream-gels obtained in
the various cases are stable and have an entirely
30 homogeneous appearance. Their viscosity is given in the
following table:

Viscosity at 20°C, in mPa.s Brookfield LVT 6 rpm	Oil used for the fatty phase of the cream-gel (3% of composition 1; fatty phase: 10%) distilled water: 87%
≈ 80,000	Jojoba oil
≈ 100,000	Sweet almond oil
≈ 80,000	Squalane
≈ 100,000	Dimethicone
≈ 65,000	Isohexadecane
≈ 100,000	Isononyl isononanoate
≈ 100,000	Cetearyl octanoate
≈ 100,000	C ₁₂ -C ₁₅ benzoate
≈ 100,000	TG Caprylic/capric
≈ 90,000	Liquid paraffin

Composition 1 thus makes it possible to disperse and stabilize the fatty phases in an aqueous medium, by simple dilution without a neutralization step being necessary.

b) Heat stability

A cream-gel comprising 2.5% of composition 1 and 20% of cetearyl octanoate was prepared and the viscosity was measured. The results are as follows:

	Brookfield LVT viscosity, 6 rpm (in mPa.s) (measured at T _a)
After 1 day at 40°C	≈ 69,000
After 7 days at 40°C	≈ 68,000
After 1 month at 40°C	≈ 66,000

c) Influence of the pH on the viscosity

The viscosity of the cream-gel prepared with composition 1 is very stable to pH in the range pH = 6 to pH = 9.

d) Compatibility with solvents

The viscosity (in mPa.s) of gels containing 3% of composition 1 was measured in various cosmetic solvents at several concentrations.

5 The results given in the following table show that the viscosity of these gels is not affected by the presence of solvents.

Solvent	20%	40%	60%
Hexylene glycol	≈ 100,000	≈ 10,000	5000
Ethanol	≈ 100,000	100,000	40,000
Dipropylene glycol	≈ 100,000	100,000	90,000
Butylene glycol	≈ 100,000	≈ 100,000	≈ 100,000
Propylene glycol	≈ 100,000	≈ 100,000	≈ 100,000
Glycerol	≈ 100,000	≈ 100,000	≈ 100,000

10 **e) Cosmetic formulae** are prepared with each of the latices prepared in paragraphs A]c), A]d) and A]e), these formulae comprising:

0.5%, 1%, 1.5%, 2%, 2.5% or 3% latex
 5% Simulsol 165,
 15 20% Lanol 1688,
 0.5% Sepicide HB
 water qs 100%.

20 It is observed that the feel sensation of the emulsions obtained is very specific at and above 1% polymer in the solution and this difference increases as the concentration increases; it is a very fresh feel sensation at the start, which melts completely on the skin, this feel sensation not being experienced at all with the latices of the prior art.

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Example 2: Care cream

Cyclomethicone: 10%
 Compound of Example 1: 0.8%
 Montanov™68: 4.5%
 30 Preserving agent: 0.65%
 Lysine: 0.025%
 EDTA (disodium salt): 0.05%

Xanthan gum:	0.2%
Glycerol:	3%
Water:	qs 100%

5 **Example 3: Care cream**

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	Cyclomethicone:	10%
	Compound of Example 1:	0.8%
	Montanov™68:	4.5%
	Perfluoropolymethyl	
10	Isopropyl ether:	0.5%
	Preserving agent:	0.65%
	Lysine:	0.025%
	EDTA (disodium salt):	0.05%
	Pumulen™TR:	0.2%
15	Glycerol:	3%
	Water:	qs 100%

Example 4: Aftershave balm

FORMULA

T.0771

20	A	Compound of Example 1:	1.5%
		Water:	qs 100%
	B	Micropearl™M 100:	5.0%
		Sepicide™CI:	0.50%
25		Fragrance:	0.20%
		95° ethanol:	10.0%

PROCEDURE

Add B to A.

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Example 5: Satin body emulsion

FORMULA

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	A	Simusol™165:	5.0%
		Lanol™1688:	8.50%
35		Karite butter:	2%
		Liquid paraffin:	6.5%
		Lanol™14M:	3%
		Lanol™S:	0.6%

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B	Water:	66.2%
C	Micropearl™M 100:	5%
5	D Compound of Example 1:	3%
E	Sepicide™CI:	0.3%
	Sepicide™HB:	0.5%
	Monteine™CA:	1%
10	Fragrance:	0.20%
	Vitamin E acetate:	0.20%

PROCEDURE

Add C to B, emulsify B in A at 70°C and then add D at
15 60°C, followed by E at 30°C.

Example 6: Body milk

FORMULA

A	Simusol™165:	5.0%
20	Lanol™1688:	12.0%
	Lanol™14M:	2.0%
	Cetyl alcohol:	0.3%
	Schercemol™OP:	3%
25	B Water:	qs 100%
C	Compound of Example 1:	0.35%
D	Sepicide™CI:	0.2%
30	Sepicide™HB:	0.5%
	Fragrance:	0.20%

PROCEDURE

Emulsify B in A at about 75°C; add C at about 60°C,
35 followed by D at about 30°C.

Example 7: O/W cream

FORMULA

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5	A	Simulsol™165:	5.0%
		Lanol™1688:	20.0%
		Lanol™P:	1.0% (stabilizing additive)
10	B	Water:	qs 100%
	C	Compound of Example 1:	2.50%
	D	Sepicide™CI:	0.20%
		Sepicide™HB:	0.30%

PROCEDURE

Introduce B into A at about 75°C; add C at about 60°C, followed by D at 45°C.

20 **Example 8: Non-greasy antisun gel**

FORMULA

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	A	Compound of Example 1:	3.00%
		Water:	30%
25	B	Sepicide™CI:	0.20%
		Sepicide™HB:	0.30%
		Fragrance:	0.10%
30	C	Dye:	q.s.
		Water:	30%
	D	Micropearl™M 100:	3.00%
		Water:	q.s. 100%
35	E	Silicone oil:	2.0%
		Parsol™MCX:	5.00%

PROCEDURE

Introduce B into A; add C, followed by D and then E.

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Example 9: Antisun milk

FORMULA

T,0200

A	Sepiperl™N:	3.0%
	Sesame oil:	5.0%
5	Parsol™MCX:	5.0%
	λ-Carrageenan	0.10%
B	Water:	q.s. 100%
10	C Compound of Example 1:	0.80%
D	Fragrance:	q.s.
	Preserving agent:	q.s.

15 PROCEDURE

Emulsify B in A at 75°C, then add C at about 60°C, followed by D at about 30°C, and adjust the pH if necessary.

20 **Example 10: Massage gel**

FORMULA

T,0201

A	Compound of Example 1:	3.5%
	Water:	20.0%
25	B Dye:	2 drops/100g
	Water:	q.s.
C	Alcohol:	10%
	Menthol:	0.10%
30	D Silicone oil:	5.0%

PROCEDURE

Add B to A; then add C to the mixture, followed by D.

35

20

Example 11: Massage care gel

FORMULA

1,0210

	A	Compound of Example 1:	3.00%
5		Water:	30%
	B	Sepicide™CI:	0.20%
		Sepicide™HB:	0.30%
		Fragrance:	0.05%
10			
	C	Dye:	q.s.
		Water:	q.s. 100%
	D	Micropearl™SQL:	5.0%
15		Lanol™1688:	2%

PROCEDURE

Prepare A; add B, followed by C and then D.

20 **Example 12: Radiant-effect gel**

FORMULA

7,0211

	A	Compound of Example 1:	4%
		Water:	30%
25	B	Elastine HPM:	5.0%
	C	Micropearl™M 100:	3%
		Water:	5%
30	D	Sepicide™CI:	0.2%
		Sepicide™HB:	0.3%
		Fragrance:	0.06%
		50% sodium pyrrolidinonecarboxylate:	1%
		Water:	q.s. 100%

35

PROCEDURE

Prepare A; add B, followed by C and then D.

Example 13: Body milk

FORMULA

T₁₀₂₂₀

A	Sepiperl™N:	3.0%
5	Glyceryl triheptanoate:	10.0%
B	Water:	q.s. 100%
C	Compound of Example 1:	1.0%
10	D	
	Fragrance:	q.s.
	Preserving agent:	q.s.

PROCEDURE

- 15 Melt A at about 75°C. Emulsify B in A at 75°C and then add C at about 60°C, followed by D.

Example 14: Make-up-removing emulsion containing sweet almond oil

20 FORMULA

556140

Montanov™68:	5%
Sweet almond oil:	5%
Water:	q.s. 100%
Compound of Example 1:	0.3%
25 Glycerol:	5%
Preserving agent:	0.2%
Fragrance:	03%

T₁₀₂₂₁

Example 15: Moisturizing cream for greasy skin

30 FORMULA

T₁₀₂₂₂

A	Montanov™68:	5%
	Cetylstearyl octanoate:	8%
	Octyl palmitate:	2%
	Water:	q.s. 100%
35	Compound of Example 1:	0.6%
	Micropearl™M100:	3.0%
	Mucopolysaccharides:	5%
	Sepicide™HB:	0.8
	Fragrance:	03%

Example 16: Alcohol-free, soothing after-shave balm

FORMULA

T,0230

	Mixture of laurylamino acids	0.1% to 5%
5	Magnesium potassium aspartate:	0.002% to 0.5%
	Lanol™99:	2%
	Sweet almond oil:	0.5%
	Water:	q.s. 100%
	Compound of Example 1:	3%
10	Sepicide™HB:	0.3%
	Sepicide™CI:	0.2%
	Fragrance:	0.4%

Example 17: Cream containing AHAs for sensitive skin

15 FORMULA

023317 24 FEB 60
T,0231

	Mixture of laurylamino acids:	0.1% to 5%
	Magnesium potassium aspartate:	0.002% to 0.5%
	Lanol™99:	2%
	Montanov™68:	5.0%
20	Water:	q.s. 100%
	Compound of Example 1:	1.50%
	Gluconic acid:	1.50%
	Triethanolamine:	0.9%
	Sepicide™HB:	0.3%
25	Sepicide™CI:	0.2%
	Fragrance:	0.4%

Example 18: Aftersun soothing care product

FORMULA

T,0233

30	Mixture of lauryl amino acids:	0.1% to 5%
	Magnesium potassium aspartate:	0.002% to 0.5%
	Lanol™99:	10.0%
	Water:	q.s. 100%
	Compound of Example 1:	2.50%
35	Sepicide™HB:	0.3%
	Sepicide™CI:	0.2%
	Fragrance:	0.4%
	Dye:	0.03%

23

Example 19: Make-up-removing milk

FORMULA

10240

	Sepiperl™N:	3%
	Primol 352:	8.0%
5	Sweet almond oil:	2%
	Water:	q.s. 100%
	Compound of Example 1:	0.8%
	Preserving agent:	0.2%

10 **Example 20: Body milk**

FORMULA

10241

	Sepiperl™N:	3.5%
	Lanol™ 37T:	8.0%
	Solagum™L:	0.05%
15	Water:	q.s. 100%
	Benzophenone:	2.0%
	Dimethicone 350cPs:	0.05%
	Compound of Example 1:	0.8%
	Preserving agent:	0.2%
20	Fragrance:	0.4%

Example 21: Alkaline-pH fluid emulsion

10242

	Marcol™82:	5.0%
	NaOH:	10.0%
25	water:	q.s. 100%
	Compound of Example 1:	1.5%

Example 22: Fluid foundation

FORMULA

10243

30	Simusol™165:	5.0%
	Lanol™84D:	8.0%
	Lanol™99:	5.0%
	Water:	q.s. 100%
	Inorganic fillers and pigments:	10.0%
35	Compound of Example 1:	1.2%
	Preserving agent:	0.2%
	Fragrance:	0.4%

Example 23: Antisun milk

FORMULA

T.O.S.O

	Sepiperl™N:	3.5%
5	Lanol™37T:	10.0%
	Parsol NOX™:	5.0%
	Eusolex™4360:	2.0%
	Water:	q.s. 100%
	Compound of Example 1:	1.8%
10	Preserving agent:	0.2%
	Fragrance:	0.4%

Example 24: Gel for around the eyes

FORMULA

T.O.S.O

15	Compound of Example 1:	2.0%
	Fragrance:	0.06%
	Sodium pyrrolidinonecarboxylate:	0.2%
	Dow Corning™245 Fluid	2.0%
	Water:	q.s. 100%

Example 25: Leave-in care composition

FORMULA

T.O.S.O

	Compound of Example 1:	1.5%
	Fragrance:	q.s.
25	Preserving agent:	q.s.
	Dow Corning™X2 8360:	5.0%
	Dow Corning™Q2 1401:	15%
	Water:	q.s. 100%

Example 26: Slimming gel

T.O.S.O

30	Compound of Example 1:	5%
	Ethanol:	30%
	Menthol:	0.1%
	Caffeine:	2.5%
35	Extract of butcher's-broom:	2%
	Extract of ivy:	2%
	Sepicide™HP:	1%
	Water:	q.s. 100%

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		Lanol™ 99:	10.0%
B		Water:	q.s. 100%
		Gluconic acid:	1.5%
		TEA (triethanolamine):	0.9%
5	C	Compound of Example 1	1.5%
	D	Fragrance:	0.4%
		Sepicide™ HB:	0.2%
		Sepicide™ CI:	0.4%

10 **Example 31: Non-greasy self-tanning product for the face and the body**

FORMULA

	A	Lanol™ 2681:	3.0%
		Compound of Example 1	2.5%
15	B	Water:	q.s. 100%
		Dihydroxyacetone:	3.0%
	C	Fragrance:	0.2%
		Sepicide™ HB:	0.8%
		NaOH (sodium hydroxide):	q.s. pH = 5%

20 **Example 32: Antisun milk containing monoï de Tahiti**

FORMULA

	A	Monoï de Tahiti:	10%
		Lipacide™ PVB:	0.5%
25		Compound of Example 1	2.2%
	B	Water:	q.s. 100%
	C	Fragrance:	0.1%
		Sepicide™ HB:	0.3%
		Sepicide™ CI:	0.1%
30		Octyl methoxycinnamate:	4.0%

Example 33: Antisun care product for the face

FORMULA

	A	Cyclomethicone and dimethiconol:	4.0%
35		Compound of Example 1	3.5%
	B	Water:	q.s. 100%
	C	Fragrance:	0.1%
		Sepicide™ HB:	0.3%
		Sepicide™ CI:	0.21%

Octyl methoxycinnamate:	5.0%
Titanium mica:	2.0%
Lactic acid:	q.s. pH = 6.5

5 **Example 34: Self-tanning emulsion**

FORMULA

T.O.S.O	A	Lanol™ 99:	15%
		Montanov™ 68:	5.0%
		Octyl para-methoxycinnamate:	3.0%
10	B	Water:	q.s. 100%
		Dihydroxyacetone:	5.0%
		Monosodium phosphate:	0.2%
	C	Compound of Example 1	0.5%
	D	Fragrance:	0.3%
15		Sepicide™ HB:	0.8%
		NaOH:	q.s. pH = 5

Example 35: Sheen gel

		Compound of Example 1	1.5%
20		Volatile silicone	25%
T.O.S.O		Monopropylene glycol	25%
		Demineralized water	10%
		Glycerol	q.s. 100%

25 **Example 36: Slimming gel**

		Compound of Example 1	1.5%
		Isononyl isononanoate	2%
T.O.S.O		Caffeine	5%
		Ethanol	40%
30		Micropearl™ LM	2%
		Demineralized water	q.s. 100%
		Preserving agent, fragrance	q.s.

Example 37: Make-up-removing milk

35		Simulsol™ 165	4%
		Montanov™ 202	1%
T.O.S.O		Triglyceride caprylate caprate	15%
		Pecosil™ DCT	1%
		Demineralized water	q.s.

Capigel™ 98	0.5%
Compound of Example 1	1%
Proteol™ oat	2%
NaOH	q.s. pH 7

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Example 38: Antisun cream

	Simulsol™ 165	3%
	Montanov™ 202	2%
	C ₁₂ -C ₁₅ benzoate	8%
10	Pecosil™ PS 100	2%
	Dimethicone	2%
	Cyclomethicone	5%
	Octyl methoxycinnamate	6%
	Benzophenone-3	4%
15	Titanium oxide	8%
	Xanthan gum	0.2%
	Butylene glycol	5%
	Demineralized water	q.s. 100%
	Compound of Example 1	1.5%
20	Preserving agent, fragrance	q.s.

Example 39: Care gel for mixed skin

	Compound of Example 1	4%
	Plant squalane	5%
25	Dimethicone	1.5%
	Sepicontrol™ A5	4%
	Xanthan gum	0.3%
	Water	q.s. 100%
	Preserving agent, fragrance	q.s.

30

Example 40: Perfumed body mask

	Compound of Example 1	1.5%
	Cyclomethicone	5%
	Fragrance	2%
35	Micropearl™ M100	5%
	Glycerol	5%
	Demineralized water	q.s. 100%

Example 41: Cream with vitamins

	Simulsol™ 165	5%
	Montanov™ 202	1%
5	Caprylic/capric triglycerides	20%
1,0300	Vitamin A palmitate	0.2%
	Vitamin E acetate	1%
	Micropearl™ M305	1.5%
	Compound of Example 1	0.7%
10	Water	q.s. 100%
	Preserving agent, fragrance	q.s.

Montanov™ 68 (cetearyl glucoside) is a self-emulsifying composition as described in WO 92/06778, sold by the company SEPPIC.

15 Micropearl™ M100 is an ultra-fine powder with a very soft feel sensation and a matt effect, sold by the company Matsumo.

Sepicide™ CI, imidazolinurea, is a preserving agent sold by the company SEPPIC.

20 Pemulen™ TR is an acrylic polymer sold by Goodrich.

Simulsol™ 165 is self-emulsifying glyceryl stearate, sold by the company SEPPIC.

25 Lanol™ 1688 is a non-greasy emollient ester sold by the company SEPPIC.

Lanol™ 14M and Lanol™ S are consistency factors sold by the company SEPPIC.

30 Sepicide™ HB, which is a mixture of phenoxyethanol, methylparaben, ethylparaben, propylparaben and butylparaben, is a preserving agent sold by the company SEPPIC.

Monteine™ CA is a moisturizer sold by the company SEPPIC.

Schercemol™ OP is a non-greasy emollient ester.

35 Lanol™ P is a stabilizing additive sold by the company SEPPIC.

Parsol™ MCX is octyl para-methoxycinnamate, sold by the company Givaudan.

Sepiperl™ N is a pearlescent agent, sold by the

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Micropearl™ SQL is a mixture of microparticles containing squalane, which is released under the action of massaging; it is sold by the company Matsumo.

Lanol™ 37T is glyceryl triheptanoate, sold by
10 the company SEPPIC.

Marcol™ 82 is a liquid paraffin sold by the company ESSO.

Parsol™ NOX is a sunscreen sold by the company Givaudan.

Dow Corning™ 245 Fluid is cyclomethicone, sold by the company Dow Corning.

Lipacide™ PVB is a palmitoylated wheat protein hydrolysate sold by the company SEPPIC.

25 Micropearl™ LM is a mixture of squalane,
poly(methyl methacrylate) and menthol, sold by the
company SEPPIC.

Sepicontrol™ A5 is a mixture of capryloylglycine, sarcosine and extract of Cinnamomum zylanicum, sold by the company SEPPIC, such as those described in International patent application PCT/FR 98/01313 filed on 23 June 1998.

Capigel™ 98 is an acrylate copolymer sold by the company SEPPIC.

35 Lanol™ 2681 is a coconut caprylate/caprate
mixture sold by the company SEPPIC.

Montanov™ 202 is an APG/fatty alcohol composition as described in WO9 98/47610, sold by the company SEPPIC.